

Claims (as filed on October 5, 2004)

*did not  
enter*

1. A capsule
  - having a diameter of less than 100  $\mu\text{m}$ , and
  - 5 - an envelope which comprises at least three polyelectrolyte layers, with the capsule only containing one dye and at least one of these three polyelectrolyte layers being labeled with the dye, which is covalently linked, at high concentration,  
10 to a sensitive material, with the sensitive material being able to react to changed environmental conditions by an increase in volume or a decrease in volume,  
with the concentration of the dye being so high that  
15 the dye forms dimers, aggregates or excimers with itself, which latter lead to self-quenching of the fluorescence or to the formation of a new emission band.
- 20 2. A capsule as claimed in claim 1, characterized in that the sensitive material is a material which either swells or shrinks, with its volume thereby being altered, when its environmental conditions change.
- 25 3. A capsule as claimed in claim 2, characterized in that the environmental conditions are the pH, the salt concentration, the temperature, adsorbed components, enzymes, the concentration of a substance, physical parameters, components which affect the solvent or  
30 which react with the sensitive material, and also miscible solvent constituents.
4. A capsule as claimed in one of claims 1 to 3, characterized in that the concentration of the dye  
35 satisfies the relationship  
mass of sensitive material:mass of dye < 500:1.
5. A capsule as claimed in one of claims 1 to 4,

characterized in that the dye-labeled layer has a thickness of from 1 nm to 1  $\mu$ m.

6. A capsule as claimed in one of claims 1 to 5,  
5 characterized in that the polyelectrolyte layer which is labeled with dyes is an organic polyelectrolyte layer which is labeled with dyes.

